WHAT IS CLAIMED IS:

1. In an extrusion head with an extrusion die (100) for extruding a tube-shaped strand from at least one thermoplastic melt (K) for producing blown films (101), wherein the extrusion head (1) has an internal member (2) arranged around a center axis (A) and an external member (3), and wherein an annular space (4) is formed between the internal member (2) and the external member (3), and wherein the annular space (4) extends concentrically with respect to the center axis (A) and terminates in the extrusion die (100), and wherein the external member (3) has at least one extrusion module (3.1, 3.2, 3.3, 3.4) with two extrusion members (30, 31), arranged on top of each other and ring-shaped and plate-shaped, and wherein a separating gap (6) which terminates in the annular space (4) is formed between the two extrusion members (30, 31) of each extrusion module (3.1, 3.2, 3.3, 3.4) and wherein each extrusion module (3.1, 3.2, 3.3, 3.4) has a feed line for a plastic melt (K) and a channel system (5) for distributing the plastic melt (K) as far as into the annular space (4) is formed in each extrusion module (3.1, 3.2, 3.3, 3.4), the improvement comprising:

the channel system (5) of each extrusion module (3.1, 3.2, 3.3, 3.4) having an inlet area (E), a branching area (V) and a spiral area (S), the spiral area (S) terminating into the annular space (4) in a ring-shaped distribution surface (309) with a ring-shaped outlet opening (309a), the inlet area (E), the branching area (V) and the

spiral area (S) of the channel system (5) each extending on a separate level, a first level (EE) of the inlet area (E) extending between a second level (EV) of the branching area (V) and a third level (ES) of the spiral area (S), and the channel system of the inlet area (E) connected with the channel system of the branching area (V) by a first group of connecting channels (51) which lead from the first level (EE) of the inlet area to the second level (EV) of the branching area, and the channel system of the branching area (V) connected with the channel system of the spiral area (S) by a second group of connecting channels (53) leading from the second level (EV) of the branching area (V) to the third level (ES) of the spiral area (S).

2. In the extrusion head in accordance with claim 1, wherein the inlet area (E) of the channel system, the branching area (V) of the channel system, and the spiral area (S) of the channel system of an extrusion module extend on the first, second and third levels (EE, EV, ES) which are arranged parallel with each other.

3. In the extrusion head in accordance with claim 2, wherein the first, second and third levels (EE, EV, ES) of the inlet area (E), the branching area (V) and the spiral area (S) are arranged so that they extend vertically relative to the center axis (A) of the extrusion head (1).

4. In the extrusion head in accordance with claim 3, wherein the first group of connecting channels (51) which connect the inlet area (E) of the channel system with the branching area (V) of the channel system, and the second group of connecting channels (53) which connect the branching area (V) of the channel system with the spiral area (S) of the channel system extend vertically with respect to the first, second and third levels (EE, EV, ES) of the inlet area (E), the branching area (V) and the spiral area (S) of the channel system, as well as coaxially with respect to the center axis (A) of the extrusion head (1).

5. In the extrusion head in accordance with claim 4, wherein the channel system (5) comprising the inlet area (E), the branching area (V) and the spiral area (S) and the groups of connecting channels (51, 53) is embodied in one of the two extrusion members (30, 31) of each extrusion module (3.1, 3.2, 3.3, 3.4).

6. In the extrusion head in accordance with claim 5, wherein the channel system (5) comprising the inlet area (E), the branching area (V) and the spiral area (S) and the groups of connecting channels (51, 53) is formed in the member of one of the extrusion modules which faces away from the extrusion die (100), identified as the lower member (30) of the extrusion module, and the second member of one of the extrusion modules, identified as the upper member (31) of the extrusion module, of each extrusion module (3.1, 3.2, 3.3, 3.4) is placed on a top of the surface

(300) embodied with the spiral area (S) of the lower member (30) of the extrusion module and forms the separating gap (6).

7. In the extrusion head in accordance with claim 6, wherein the spiral area (S) of the channel system is formed in a surface (300) of the lower member (30) of the extrusion module facing the separating gap (6), the branching area (V) of the channel system is formed in an oppositely located surface (301) of the lower member (30) of the extrusion module facing away from the separating gap (6), and the entry area (E) of the channel system is formed between the two surfaces (300, 301) within the lower member (30) of the extrusion module.

8. In the extrusion head in accordance with claim 7, wherein the channel system of the spiral area (S) is formed of spiral channels (54), and the channel system of the branching area (V) is formed of branching channels (52a, 52b) which branch out, and at least one of the spiral channels (54) and the branching channels (52a, 52b) are cut as grooves into the two surfaces (300, or 301) of the lower member (30) of the extrusion module.

9. In the extrusion head in accordance with claim 8, wherein the lower member (30) of the extrusion module of each extrusion module (3.1, 3.2, 3.3, 3.4), which has the channel system (5), is embodied on the surface (301) located opposite the surface (300) having the spiral channels (54), with a circumferential annular groove (302) forming a groove bottom, and a pre-distribution ring (7) is insertable into the annular groove (302), wherein the pre-distribution ring (7) has a surface (701) resting on the groove bottom of the annular groove (302), and the branching area (V) is embodied on the surface (301) of the member (30) of the extrusion module near the groove bottom of the annular groove (302).

10. In the extrusion head in accordance with claim 9, wherein the branching channels forming the branching area (V) have a cross section, wherein a portion of the cross section (52a, 52b) is embodied in the surface (301) of the lower member (30) of the extrusion module near the groove bottom of the annular groove (302), and a complementary portion of the cross section (52a', 52b') is embodied on the surface (701) of the pre-distribution ring (7) near the groove bottom (302) of the lower member (30) of the extrusion module.

11. In the extrusion head in accordance with claim 10, wherein the pre-distribution ring (7) has a greater thickness than a depth of the annular groove (302) of the lower member (30) so that the pre-distribution ring (7) projects with a portion of its cross section past the annular groove (302) in the direction toward the adjoining extrusion module, and the projecting portion of the pre-distribution ring (7) is fitted into a complementarily designed annular groove in a top (312) of the upper member (31) of an adjoining following extrusion module (3.1, 3.2, 3.3, 3.4).

12. In the extrusion head in accordance with claim 11, wherein the entry area (E) of the channel system has two inlet channels (50) arranged in a V-shape relative to each other and extend from an inlet opening (307) at the circumference of the lower member (30) and terminate opposite each other and are centered with respect to the central axis (A), and which communicate at the two ends (50a) of the inlet channels with each one of a connecting channel (51) leading to the branching area (V).

13. In the extrusion head in accordance with claim 12, wherein in the branching area (V) two branching systems are formed symmetrically with respect to each other, starting at the two connecting channels (51) emanating from the inlet channels (50), and each of the branching systems again branches into four identical branching channels (52), and eight ends (55) of the branching channels (52) are

evenly distributed on a circular ring coaxially to the center axis (A), and respectively communicate with a connecting channel (53) leading to the spiral area (S).

14. In the extrusion head in accordance with claim 13, wherein the spiral area (S) comprises the spiral channels (54) placed inside each other and extending inward in a converging manner toward the annular space (4) and communicate at radially outside located ends with one of the connecting channels (53) coming from the branching area (V), and the spiral channels (54) have a cross section decreasing from an outside toward an inside.

15. In the extrusion head in accordance with claim 14, wherein all flow paths for the plastic melt (K) through the channel system (5) in one of the at least one extrusion module (3.1, 3.2, 3.3, 3.4) are of equal length from the inlet opening (307) to the outlet opening (309a) into the annular space (4).

16. In the extrusion head in accordance with claim 15, wherein the at least one extrusion module (3.1, 3.2, 3.3, 3.4) can be separately heated.

17. In the extrusion head in accordance with claim 1, wherein the first, second and third levels (EE, EV, ES) of the inlet area (E), the branching area (V) and the spiral area (S) are arranged so that they extend vertically relative to the center axis (A) of the extrusion head (1).

18. In the extrusion head in accordance with claim 1, wherein the first group of connecting channels (51) which connect the inlet area (E) of the channel system with the branching area (V) of the channel system, and the second group of connecting channels (53) which connect the branching area (V) of the channel system with the spiral area (S) of the channel system extend vertically with respect to the first, second and third levels (EE, EV, ES) of the inlet area (E), the branching area (V) and the spiral area (S) of the channel system, as well as coaxially with respect to the center axis (A) of the extrusion head (1).

19. In the extrusion head in accordance with claim 1, wherein the channel system (5) comprising the inlet area (E), the branching area (V) and the spiral area (S) and the groups of connecting channels (51, 53) is embodied in one of the two extrusion members (30, 31) of each extrusion module (3.1, 3.2, 3.3, 3.4).

20. In the extrusion head in accordance with claim 1, wherein the channel system (5) comprising the inlet area (E), the branching area (V) and the spiral

area (S) and the groups of connecting channels (51, 53) is formed in the member of one of the extrusion modules which faces away from the extrusion die (100), identified as the lower member (30) of the extrusion module, and the second member of one of the extrusion modules, identified as the upper member (31) of the extrusion module, of each extrusion module (3.1, 3.2, 3.3, 3.4) is placed on a top of the surface (300) embodied with the spiral area (S) of the lower member (30) of the extrusion module and forms the separating gap (6).

21. In the extrusion head in accordance with claim 1, wherein the spiral area (S) of the channel system is formed in a surface (300) of the lower member (30) of the extrusion module facing the separating gap (6), the branching area (V) of the channel system is formed in an oppositely located surface (301) of the lower member (30) of the extrusion module facing away from the separating gap (6), and the entry area (E) of the channel system is formed between the two surfaces (300, 301) within the lower member (30) of the extrusion module.

22. In the extrusion head in accordance with claim 1, wherein the channel system of the spiral area (S) is formed of spiral channels (54), and the channel system of the branching area (V) is formed of branching channels (52a, 52b) which branch out, and at least one of the spiral channels (54) and the branching channels

(52a, 52b) are cut as grooves into two surfaces (300, or 301) of the lower member (30) of the extrusion module.

23. In the extrusion head in accordance with claim 1, wherein the lower member (30) of the extrusion module of each extrusion module (3.1, 3.2, 3.3, 3.4), which has the channel system (5), is embodied on a surface (301) located opposite another surface (300) having the spiral channels (54), with a circumferential annular groove (302) forming a groove bottom, and a pre-distribution ring (7) is insertable into the annular groove (302), wherein the pre-distribution ring (7) has a surface (701) resting on the groove bottom of the annular groove (302), and the branching area (V) is embodied on the surface (301) of the member (30) of the extrusion module near the groove bottom of the annular groove (302).

24. In the extrusion head in accordance with claim 23, wherein the branching channels forming the branching area (V) have a cross section, wherein a portion of the cross section (52a, 52b) is embodied in the surface (301) of the lower member (30) of the extrusion module near the groove bottom of the annular groove (302), and a complementary portion of the cross section (52a', 52b') is embodied on the surface (701) of the pre-distribution ring (7) near the groove bottom (302) of the lower member (30) of the extrusion module.

25. In the extrusion head in accordance with claim 9, wherein the pre-distribution ring (7) has a greater thickness than a depth of the annular groove (302) of the lower member (30) so that the pre-distribution ring (7) projects with a portion of its cross section past the annular groove (302) in the direction toward the adjoining extrusion module, and the projecting portion of the pre- distribution ring (7) is fitted into a complementarily designed annular groove in a top (312) of the upper member (31) of an adjoining following extrusion module (3.1, 3.2, 3.3, 3.4).

26. In the extrusion head in accordance with claim 1, wherein the entry area (E) of the channel system has two inlet channels (50) arranged in a V-shape relative to each other and extend from an inlet opening (307) at the circumference of the lower member (30) and terminate opposite each other and are centered with respect to the central axis (A), and which communicate at the two ends (50a) of the inlet channels with each one of a connecting channel (51) leading to the branching area (V).

27. In the extrusion head in accordance with claim 1, wherein in the branching area (V) two branching systems are formed symmetrically with respect to each other, starting at the two connecting channels (51) emanating from the inlet channels (50), and each of the branching systems again branches into four identical branching channels (52), and eight ends (55) of the branching channels (52) are

evenly distributed on a circular ring coaxially to the center axis (A), and respectively communicate with a connecting channel (53) leading to the spiral area (S).

28. In the extrusion head in accordance with claim 1, wherein the spiral area (S) comprises the spiral channels (54) placed inside each other and extending inward in a converging manner toward the annular space (4) and communicate at radially outside located ends with one of the connecting channels (53) coming from the branching area (V), and the spiral channels (54) have a cross section decreasing from an outside toward an inside.

29. In the extrusion head in accordance with claim 1, wherein all flow paths for the plastic melt (K) through the channel system (5) in one of the at least one extrusion module (3.1, 3.2, 3.3, 3.4) are of equal length from the inlet opening (307) to the outlet opening (309a) into the annular space (4).

30. In the extrusion head in accordance with claim 1, wherein the at least one extrusion module (3.1, 3.2, 3.3, 3.4) can be separately heated.